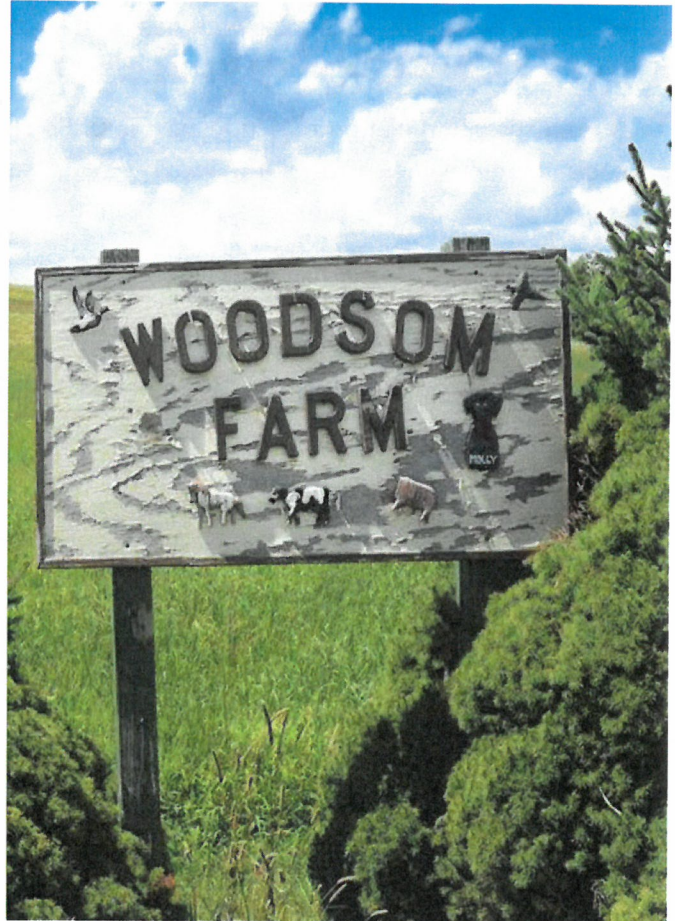


During the prioritization of actions at the CRB Workshop, one of the two top priorities that CRB Workshop participants identified was the need to plan for and implement projects that address existing and future water management infrastructure, and to address riverbank erosion issues. Core Team and NRIA Team meeting participants also identified this as a top priority. Priorities included:

- Conduct a community-wide culvert replacement and upgrade (i.e. with goal to meet Massachusetts stream crossing standards) hydrologic and feasibility study
- Conduct a community-wide flooding assessment and identify Nature-Based Solutions, focusing on areas known to have recurring and worsening flooding problems such as:
 - Lower Mill Yard
 - Elm Street
 - The Golden Triangle
 - Downtown Amesbury
 - 24 South Hampton Road/Amesbury Elementary School Area
 - The Middle School Area
 - Bailey's Pond
 - Arch Brook Culvert
- Implement culvert replacement and upgrade projects, once studies are completed
- Hydrologic management of Lake Attitash and Lake Gardner
- Address riverbank erosion issues, focusing on areas known to be eroding, and on Nature-Based Solutions. Known areas with riverbank erosion issues include:
 - Merrimac River bank adjacent to Pleasant Valley Road
 - Powwow River as it flows through downtown area and past the NGRID station
 - Back River banks
- Conduct study of hazardous facilities that are located in the flood zone, plan for management during flood events



*Woodsom Farm
Source: Bryan Eaton*

Emergency/ Community Preparedness/Vulnerable Populations

Participants felt strongly that an effort should be undertaken to provide more education and outreach for community members and municipal staff, and particularly for the most vulnerable, such as the elderly, English language learners, and the very young, about climate change vulnerability, preparedness, resources and response. Emergency response plans should include planning for vulnerable populations. Regional coordination should also occur with neighboring communities, and the City should draw upon the capacity provided by state agencies to enhance its overall capacity to address the needs of climate preparedness.

During the prioritization of actions at the CRB Workshop, participants also identified the need to address social vulnerabilities as one of the top two priorities, such as improving protection and rescue of the most vulnerable citizens during severe climate events. Core Team meeting participants also identified this as a top priority. Specific actions that could be taken included:

- Improving emergency communications and coordination between police, fire and dispatch
- Developing a coordinated evacuation plan
- Improving emergency services for the elderly, English language learners, and for school populations
- Modifying and updating hazard mitigation plans and communication plans
- Improving plans for community assembly areas
- Protecting community shelter access routes from flooding



Local Regulatory Structure/Planning

Workshop participants felt that many of the ordinances and policies that serve to direct and guide planning and development throughout the municipality to protect natural resources and to plan for hazard mitigation could be updated to incorporate climate resiliency and to improve emergency response. During the prioritization of actions at the CRB Workshop, participants identified the following actions:

- Encourage green infrastructure and low impact development – develop a Green Infrastructure zoning overlay for downtown area
- Zoning and stormwater updates, including updating and finishing the Amesbury zoning handbook to address climate resiliency; add a climate resiliency zoning overlay, such as Woodsom Farm flood control overlay
- Update and implement the Stormwater Ordinance

Natural Resources Management

A high priority need identified by the community was for regional coordination to address flooding issues, since Amesbury is located downstream from much of the Merrimack River watershed and is also affected by Merrimack River tidal flooding and coastal storm surge. Nature Based Solutions within the Merrimack River, Powwow River, and Back River floodplains and within known drainage paths throughout the community were recommended. Efforts to address nuisance species such as invasive species

and algal blooms were also noted as important climate resilience planning features. Improving the capacity of the trees in the downtown area to absorb flood waters and to provide shade was identified as a high priority action as well. The need to update the Open Space Plan and assess which areas of valuable open space have or have not been protected was recognized.



*Flooding in Spring 2018 along the Merrimack River, causing it to overflow onto Main Street at Point Shore
Source: Bryan Eaton, Newburyport News*

Woodsom Farm, located on Lion's Mouth Road, represents an important ecological and cultural asset within the community. Engaged community members and leadership are committed to the societal and environmental significance of Woodsom Farm, and the benefits/ecosystem services it provides. Woodsom Farm is located northwest of the city center and provides significant wetland and flood storage areas associated with the Powwow River, which flows through Woodsom Farm to Lake Gardner, and thence through downtown Amesbury. The City had originally purchased Woodsom Farm to eliminate odors from the farm's piggery and have since recognized its significant recreational and ecological values and ecosystem services. Of particular note is the use of the grassland habitat by bobolinks (*Dolichonyx oryzivorus*) for nesting. Through the MVP and associated Natural Resources Infrastructure Assessment (NRIA) process, MVP Core Team members, NRIA team members, and CRB Workshop participants have become aware of the significant flood storage and water quality ecosystem services provided by Woodsom Farm, and the importance of protecting this resource as potential mitigation for flooding. By protecting floodplains and wetlands at Woodsom Farm, the city is protecting the downtown area in a similar, if smaller scale, way that the Charles River Natural Valley Storage Project protects community infrastructure in the lower Charles River watershed. Specific actions could include developing a flood and water quality protection zoning overlay and providing community education and outreach to increase awareness of the importance of using this resource in such a manner. While participants recognized the value of creating a flood storage zoning overlay for the floodplain and wetlands at Woodsom Farm, they felt that this should be a lower priority than other actions as citizens have recently designated Woodsom Farm as Woodsom Farm Park through Amesbury Bill 2018-086 (02/19/2019)

CRB Workshop Matrix and Prioritization of Actions

Climate Resilience Actions to address the concerns and vulnerabilities identified through the workshop process, and build upon existing strengths, were prioritized through workshop activities and coordination with Core Team leadership. Climate Resilience Actions listed in the tables below are organized as High Priority (H), Medium Priority (M), and Low Priority (L) Actions. During the Core Team meetings prior to the CRB Workshop, Core Team members determined that the CRB Workshop Risk Matrix spreadsheet could be modified to improve clarity and to allow for actions and features to be placed in more than one category, if applicable. The table below and the CRB Workshop Risk Matrix included in the Appendix reflect these modifications. CRB Workshop participants voted on their top priorities, with the result that two categories tied for first place: Addressing issues of flooding and drainage infrastructure throughout the city and addressing social vulnerability/vulnerable populations. Climate resiliency education for both the public and municipal staff was the third highest priority. Only these top priorities are given numbers in the tables below.

High Priority Actions

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
H-1	X	X	X	Culvert and stormwater drainage system/infrastructure - Promote ecological restoration. See 24 South Hampton Road notes. Bailey's Pond hydrologic study, culvert replacement and stream restoration. Conduct town-wide stormwater and culvert assessment. Look for opportunities to use LID. Prioritize co-benefits and Nature Based Solutions.
H-1	X	X	X	Pleasant Valley Road/utilities/flooding - Conduct hydrologic study and project to replace undersized culverts to meet stream crossing standards. Conduct coastal storm surge study to assess medium to long-term outlook for embankment, road and property viability over the coming decades, develop Nature Based responses/solutions. Address Merrimack River embankment erosion with living shorelines solutions.
H	X	X	X	NGRID Substation on Powwow River, especially retaining wall - Assess for solutions, consider infrastructural and Nature Based Solutions, work with NGRID to plan for the future, upgrade critical facilities management process, relocate substation.
H	X	X	X	Electric Utility redundancy/availability/supply - Increase communication/cooperation to increase reliability, decentralize power sources, locate utilities underground, switch to alternative sources of energy.

H-1	X	X	X	Downtown Center/Main Street Bridge/Upper Millyard/Commercial Areas - Conduct flooding and stormwater management study and then replace undersized catch basins, install raingarden, tree wells, etc. Install stormwater sidewalks, develop incentives for businesses to install green roofs and walls. Conduct study to restore and stabilize Powwow River embankments, including removal of asbestos-lined pipe that runs over and along the Powwow River. Assess opportunities to reduce impervious cover and increase tree canopy at parking lot adjacent to Upper Millyard.
H-1	X	X		Shelters/Assembly Areas - Identify/establish backup energy generation, coordinate with NGRID, conduct community engagement & outreach effort, establish accessibility programs.
H-1		X		Vulnerable populations - Identify/ improve understanding of socially vulnerable populations, improve communication systems, improve access to information, conduct outreach, connect vulnerable to shelters/cooling centers during emergencies. Vulnerable populations include elderly, English language learners, and the very young.
H-2		X		Community outreach/Community based support service coordination - Community outreach about climate resiliency and emergency response to city leadership, citizens and stakeholders. Plan and coordinate with regional partners, as Amesbury receives water from adjacent and upstream towns in both Massachusetts and New Hampshire. Look for opportunities to coordinate flood control on regional level. Conduct outreach/education at the local level. Consider tax breaks. Leverage state and local resources to expand capacity.
H		X	X	Disaster planning, evacuation plans, Hazard Mitigation Plan, Open Space Plan, Master Plan – Update disaster planning, evacuation plans, Hazard Mitigation Plan, Open Space Plan, Master Plan, incorporate climate resiliency.
H	X	X	X	Evaluate regulatory approaches. Conduct Zoning, Ordinances, Regulatory updates to incorporate climate resiliency - Conduct a regulatory review and do community outreach and education. Integrate climate considerations into regulatory changes (Zoning, and other Ordinances, Open Space planning) Develop a floodplain overlay district. Renew and permanently protect Open Space. Find room for flood mitigation. Include Nature Based Solutions, LID, Green Infrastructure, Flood zone regulation. Update planning and develop new policies for water supply (public and private) and for sewer, favoring use of town water and sewer.

H-1	X	X	X	Golden Triangle area - Conduct flood storage/hydrologic study to facilitate culvert replacement so that culverts meet stream crossing standards. Undersized culverts are located under Rt 110 and under Elm Street. Develop plans for streambank and ecological restoration: invasive species removal, potential increase in flood storage capacity, stabilize streambanks.
H	X	X	X	Lakes Attitash and Gardner - Lake Attitash: address water quality issues (invasive species, runoff, fertilizer, algal blooms). Conduct community engagement workshops, engage the private sector. Assess impact of power boats on water quality.
H	X	X	X	Downtown Tree Planting/Re-planting - Re-plant trees to enhance shade and safety, use tree wells.

Medium Priority Actions

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
M	X			Lake Gardner Dam - Assess for earthquake vulnerability.
M	X			Rt 95 and other roads - Work with MassDOT & abutting communities, address road flooding, improve culvert capacity.
M	X	X		Emergency routes - Develop a coordinated evacuation plan.
M	X	X		Wastewater facility - Assess opportunity to discharge to location other than Merrimack River (where currently discharges), conduct outreach and education to raise awareness.
M			X	Streams, ponds, wetlands, rivers - Conduct study to restore and expand flood storage capacity.
M		X	X	Open Space - Permanently protect open space.
M	X			Tuxbury Pond - Repair cracks in old flood control structure or replace structure.
M	X	X	X	24 South Hampton Road - South Hampton Road hydrologic study, culvert replacement and stream restoration, including invasive species removal, near school.
M	X		X	Back River and Clark's Pond - Develop bank and river corridor management plans and maintenance program. Deepen pond/remove silt from Clark's Pond, improve gate to allow adjustments, continue invasive species control, consider a fish ladder.

Low Priority Actions

Priority	Categories			Action
	Infra-structure	Social	Environ-mental	
L		X	X	Woodsom Farm - Protect flood storage value.


Community Workshop Participants

Name	Affiliation
Alan Corey	Conservation Commission
Michael Jewell	Lake Attitash Resident
Deborah Smith	Pettengill House, Inc.
Richard Marggraf	Amesbury City Council
Cory Riley	Citizen Representative
Lauren LeBlanc	Senator Dizoglio's Office
David Haraske	Zoning Board of Appeals
Matt Chapin	Lake Street Waterways
Jack Morris	Health Department
John Lopez	Conservation Commission
Derek Salisbury	Lake Attitash
Ronald G. Guilnette	Amesbury Police Department
Peter Phippen	Merrimack Valley Planning Commission
Tom Murphy	Clarks Pond Watershed Association
Kassandra Gove	Amesbury Chamber of Commerce
Cory Townsend	Our Neighbor's Table
Jim Nolan	Amesbury Fire Department
Yvonne Bednarz	Lake Attitash Association
Thomas Barrasso	City of Amesbury
Denis Nadeau	City of Amesbury
Derek Salisbury	Lake Attitash Association
Anthony S. Rinadli	Energy Commission/Clarks Pond Association
Joe Muraco	National Grid


LISTENING SESSIONS

A listening session was held on Thursday, May 16, 2019 at the Amesbury Senior Community Center, from 6 pm – 7 pm (see invitation below). This session allowed members of the public to hear presentations on the MVP process in Amesbury, and to provide feedback to Amesbury leaders that can further inform the Community Resilience Building process. Ideas from the public were recorded on a flip board, and are noted in the table below:

Use master plan process to further refine prioritization of projects.
Place a greater prioritization on protecting open space, especially around water supplies.
Greenbelt has a potential to be a strong partner in protecting open space and water supply.
Since Woodsom Farm is managed under Article 97, both passive and active recreation are allowed there.
Attendees noted that Lake Gardner poses a risk for flooding the downtown area, as the Lake Gardner dam was overtopped during the Mother's Day storm.



City of Amesbury
Department of Energy &
Environmental Affairs
Thomas Barrasso,
Director

Community Resilience Building 

Get on the right path to resilience today...

**AMESBURY MUNICIPAL VULNERABILITIES PREPAREDNESS
PUBLIC LISTENING SESSIONS:**

**ATTEND THE CITY OF AMESBURY
MUNICIPAL VULNERABILITY PREPAREDNESS and
NATURAL RESOURCES INFRASTRUCTURE ASSESSMENT
LISTENING SESSIONS**


WHEN: Thursday, May 16th, 6 pm - 8 pm
WHERE: AMESBURY SENIOR COMMUNITY CENTER
 68 Elm Street
 Amesbury, MA 01913

Questions? Call Tom Barrasso (978)388-8110 x314

MUNICIPAL VULNERABILITY PREPAREDNESS (MVP) LISTENING SESSION (6 PM – 7 PM): Come find out what your city has been doing to prepare for hazards resulting from our changing climate, such as: increased flooding due to severe storms and sea level rise, increased high heat and drought in the summer, and increased wind damage from storm events. Amesbury is in the process of achieving MVP certification, a pre-requisite for obtaining funding for state Action Grants that support community climate resiliency preparedness. The Amesbury MVP report will be available as of Monday, May 10th on the City of Amesbury's Department of Energy and Environmental Affairs website <https://www.amesburyma.gov/energy-environment-affairs>. Bring your questions and ideas!

NATURAL RESOURCES INFRASTRUCTURE ASSESSMENT LISTENING SESSION (7 PM – 8 PM): Immediately following the MVP Listening Session, a second listening session will be held. In support of the Amesbury MVP program, the city won a state grant to fund an assessment of natural resources within the city and opportunities to conserve, protect and restore ecological resources that provide flood storage, storm damage prevention, water quality improvement, pollution prevention, and fish and wildlife habitat. These services provided by wetlands, floodplains, forests and stream/river systems help protect Amesbury from the effects of climate change (heat, floods, storms). Come see the maps and results of the assessment and bring your questions and ideas. The Amesbury MVP report will be available as of Monday, May 6th, the Amesbury **NRIA** report will be available on the City of Amesbury's Department of Energy and Environmental Affairs website: <https://www.amesburyma.gov/energy-environment-affairs>.

Visit the Massachusetts Municipal Vulnerabilities Preparedness Program website to learn more at:
<https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program>



Invitation to MVP and Natural Resources Infrastructure Assessment Listening Sessions

Citation

Amesbury (2019) Community Resilience Building Workshop Summary of Findings, BSC Group, Inc. and City of Amesbury. Amesbury, Massachusetts

MVP Core Team Working Group

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John Lopez, Conservation Commission Agent, City of Amesbury
Craig Bailey, Lieutenant, Amesbury Police Department
Robert Desmarais, Director of Public Works, City of Amesbury
Peter Manor, Department of Public Works, City of Amesbury
Denis Nadeau, Zoning Compliance Officer, City of Amesbury
Cory Riley, Amesbury Citizen
Jack Morris, Regional Health Director, City of Amesbury
James Nolan, Deputy Fire Chief, Amesbury Fire Department
Bill Scott, Director of Office of Community and Economic Development, City of Amesbury
Nipun Jain, Director of Planning, Office of Community and Economic Development, City of Amesbury
Gillian T. Davies, Senior Ecological Scientist, BSC Group, Inc.
Jeffrey T. Malloy, Senior Climate Adaptation Planner, BSC Group, Inc.

Workshop Facilitators

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Ale Echandi, BSC Group, Inc.
Kaitlyn Rimol, BSC Group, Inc.
Dominic Rinaldi, BSC Group, Inc.

Acknowledgements

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Thank you to the community leaders within Amesbury who attended the Amesbury CRB Workshop. The institutional knowledge provided by workshop participants was essential to the success of this process.

APPENDIX

